CLAIMS

What is claimed is:

1-48 (Canceled)

49. A composition suitable for inducing an immune response to anthrax in a subject when administered to a mucosal surface of the subject, comprising two or more different isolated anthrax antigens and at least one mucosal adjuvant in amounts suitable for inducing an immune response to anthrax in the subject, wherein the immune response can ameliorate or prevent at least one symptom of anthrax disease.

50. The composition of claim 49, wherein the two or more different anthrax antigens are selected from the group consisting of non-vegetative anthrax spore antigens and vegetative anthrax bacterial antigens.

51. The composition of claim 50, wherein the two or more different anthrax antigens are vegetative anthrax bacterial antigens selected from the group consisting of cell wall antigens, capsule antigens and secreted antigens.

52. The composition of claim 51, wherein the two or more different vegetative anthrax bacterial antigens are anthrax peptides selected from the group consisting of protective antigen (PA), lethal factor (LF), edema factor (EF), poly(γ-D-glutamic acid) (PGA) and immunogenic fragments thereof.

53. The composition of claim 52, wherein one of the two or more anthrax peptides is PA or an immunogenic fragment thereof and one is PGA or an immunogenic fragment thereof.

54. The composition of claim 53, wherein at least some of the PA peptide is conjugated to the PGA peptide.

55. The composition of claim 54, wherein the PGA peptide is synthetic.

56. The composition of claim 55, wherein the PGA peptide is a 10mer of poly(γ-D-glutamic acid).

57. The composition of claim 49, wherein the at least one mucosal adjuvant is selected from the group consisting of monophosphoryl lipid A (MPL), trehalose dicorynomycolate (TDM), signaling transducer receptor of LPS, chitosan and other positively charged polysaccharides and agonists of toll-like receptors.

58. The composition of claim 57, wherein the composition comprises two or more mucosal adjuvants.

59. The composition of claim 58, wherein one of the two or more adjuvants is chitosan and one is MPL.

60. The composition of claim 49, wherein the composition is formulated as a dry powder.

61. The dry powder composition of claim 60 in combination with one or more devices for administering one or more doses of said composition.

62. The dry powder composition of claim 61, wherein said one or more doses are unit doses.

63. The dry powder composition of claim 61, wherein the device is a single-use nasal administration device.

64. The composition of claim 49, wherein the immune response comprises a primary immune response.

65. The composition of claim 49, wherein the immune response comprises a secondary immune response.

66. The composition of claim 49, wherein the immune response comprises eliciting antigen-specific serum IgG.

67. The composition of claim 49, wherein the immune response comprises eliciting antigen-specific secretory IgA.

68. A method of inducing an immune response to anthrax in a subject, comprising administering to a mucosal surface of the subject an effective amount of the composition of claim 49.

69. The method of claim 68, wherein replication of anthrax in the subject is inhibited.

70. The method of claim 68, wherein anthrax exotoxin in the subject is neutralized.

71. The method of claim 68, wherein the immune response is a protective immune response.

72. The method of claim 68, wherein the mucosal surface is selected from the group consisting of a nasal mucosal surface and an oral mucosal surface.

73. The method of claim 68, wherein the subject has not been exposed to anthrax.

74. The method of claim 68, wherein the subject is infected with anthrax.

75. The method of claim 68, wherein the subject has been exposed to anthrax.

76. The method of claim 75, wherein the subject does not display visible signs of anorexia, lethargy and/or death as a result of exposure to anthrax.

77. The method of claim 76, wherein the subject does not display visible signs of anorexia, lethargy and/or death up to 2 weeks after anthrax exposure.